QUES 06

A graph of x versus t is shown in figure.

Choose the correct alternatives given below.
(a) The particle was released from rest at t =0
(b) At B, the acceleration a >0
(c) At C, the velocity and the acceleration vanish.
(d) Average velocity for the motion between Aand D is positive.
(e) The speed at D exceeds that at E

Sol: (a, c, e)
Key concept: We know that velocity v = dx/dt and slope of x-t graph gives '
us velocity. This implies slope = dx/dt for the graph.
As per the diagram, at point A the graph is parallel to time axis, hence dx
v = dx/dt = 0. As the starting point is A, hence we can say that the particle is starting from rest. Thus option
(a) is correct.
At C, the graph changes slope, hence velocity also changes. As graph at C is almost parallel to time axis,
hence we cam say that velocity vanishes. Hence option (c) is correct.
As direction of acceleration changes, hence we can say that it may be zero in between.
From the graph it is clear that | slope at D| > | slope at E |
Hence, speed at D will be more than at E. Hence option (e) is correct.
Important point: Here, negative slope does not mean less value. It represents change in direction of velocity.